FOREST PEST MANAGEMENT
Pacific Southwest Region 85 4264

Report No. 85-19

3430 Evaluation
September 9, 1985

EVALUATION OF BARK BEETLE CONDITIONS IN THE GLENBROOK BURN, LAKE TAHOE BASIN MANAGEMENT UNIT

John Wenz, Entomologist

ABSTRACT

At the request of the Lake Tahoe Basin Management Unit (LTBMU), in July, 1985, the Forest Pest Management (FPM) Staff evaluated the LTBMU-managed part of the Glenbrook Burn, which occurred in November, 1984. Insects found utilizing the fire-damaged trees included the red turpentine beetle, Dendroctonous valens and pine engravers (Ips pini; I. emarginatus) as well as woodborers and ambrosia beetles. Western dwarf mistletoe, Arceuthobium camplyopodum, was found in Jeffrey pine throughout the area. Based on current observations, the insect activity in the area examined does not appear to constitute a significant threat to trees in nearby unburned areas.

INTRODUCTION

On November 2, 1984, a 107 acre wildfire occurred near Glenbrook, Nevada, on the east side of Lake Tahoe. The area burned included approximately 69 acres of National Forest land managed by the Lake Tahoe Basin Management Unit (LTBMU), Pacific Southwest Region. In July, 1985, the LTBMU requested an evaluation of those 69 acres by the Forest Pest Management (FPM) Staff to (a) determine the extent to which bark beetles were building-up in the fire-damaged trees and (b) assess the potential for these beetles to emerge and attack trees in nearby unburned areas. The area was examined on July 23 by John Wenz (Entomologist, FPM Staff) and Don Breitinger (Resources Officer, LTBMU).

OBSERVATIONS

Much of the burned area evaluated was on a rocky, 40%-60%, slope with a conifer overstory consisting primarily of Jeffrey pine (Pinus jeffreyi) and a relatively small amount of white fir (Abies concolor). Stocking levels varied from less than 100 sq.ft./acre on the steeper, rocky areas to about 300 sq.ft./acre or more in a few aggregations located on more stable areas with somewhat deeper soils. Most of the openings were occupied by brush including

manzanita (Arctostaphylos sp.) and ceanothus (Ceanothus sp.). Many of the trees had significant (50% or more) crown scorch. The extent and height of bark scorch was quite variable; in some trees, sections of the bole where the cambium had been heat-killed were starting to callous-over (sometimes associated with clear pitch streaming); in others, the cambium was still alive but, in many cases, beginning to dry out and change color.

Approximately 20% to 30% of the trees examined had been, or were currently being, attacked by the red turpentine beetle, Dendroctonous valens (Dv). Most of these attacks, indicated by large pitch tubes and reddish boring dust, were located in the lower 1-2 feet of the bole with several situated at the ground line. A few "pitch-outs" were observed with adult beetles trapped in the pitch. Initial, incipient, gallery construction was noted in a few trees, but no Dv eggs were observed.

Several of the Jeffrey pine examined had been attacked earlier in the spring by pine engraver beetles, including Ips pini and I. emarginatus. Pine engraver larvae, pupae and brood adults were all present at the time of the evaluation and some emergence had already occurred as evidenced by numerous emergence holes in the bark of a few trees. Many of the trees attacked by Ips sp. had also been attacked at the base by Dv.

In addition, some trees had been colonized by woodborers and/or ambrosia beetles. These trees tended to be those killed outright by the fire or with more than 90% crown scorch and were probably attacked immediately after the fire occurred or early in the spring. Woodborers were also found associated with trees that had been successfully attacked by pine engravers.

Western dwarf mistletoe, Arceuthobium campylopodum, was present at moderate to high infection levels in Jeffrey pine throughout the area examined.

DISCUSSION

Based on these observations, there does not appear to be a significant build-up of bark beetles in the LTBMU-managed part of the Glenbrook burn from the standpoint of providing an increased threat to trees in nearby unburned areas. The red turpentine beetle often attacks fire scorched trees and it is not surprising that a number of trees in the burn were attacked. At Lake Tahoe, Dv probably has a 1 (sometimes 2) year life cycle with adult flight and initiation of new attacks occurring from June-August, depending on weather. It is likely that attacks will continue to occur in the burned area through 1986 and 1987 at a declining rate, as the most susceptible trees weaken and die. The red turpentine beetle does not characteristically reach epidemic levels, is usually not an aggressive species in the sense of killing healthy trees and its activity in the burn should not increase the probability of trees in nearby unburned areas being attacked.

It is also not unusual to see pine engravers attack fire-weakened trees. Serious pine engraver problems generally occur only when good host material (fresh slash, windfalls) is abundant, allowing large populations to develop which, upon emergence, can attack nearby healthy trees. This is not the case

in the Glenbrook burn situation. The fire-damaged trees were probably most conducive to good brood development this spring when the phloem/cambium was still fresh enough to support good brood development. As the scorched trees weaken and eventualy die, they no longer provide suitable habitat for the beetles. Through time (1-2 years after the burn), the number of susceptible trees should decline and, in addition, those trees that are successfully attacked may provide a reduced food base resulting in decreased brood survival and emergence. Thus, some additional attacks can be expected in 1986, but, as with Dv, pine engraver populations are unlikely to build up to levels that would increase the chances of trees in nearby unburned areas being attacked

As trees in the burned area die, they will most likely be utilized by wood-borers and ambrosia beetles. With very few exceptions, these beetles attack only dead and dying trees and are not a threat to healthy conifers outside (or inside) the burned area.

It should be pointed out that both Dv and Ips sp., as well as other bark beetles, are native to the Lake Tahoe area and have evolved along with their coniferous hosts. Consequently, there is some chance that any given tree will be attacked and killed in any given year. Experience indicates that less vigorously growing trees (due to, for example, competition from overstocking, drought, disease, etc.) and trees that have been weakened or injured in some way (e.g., lightening, mechanical injury, fire) are more susceptible to bark beetle attack. Two factors are relevant in this context; first, while specifics for the Glenbrook area are not available, a decided moisture deficit has occurred during the spring and early summer of 1985 over most of the central and northern Sierra; second, dwarf mistletoe was observed in Jeffrey pine (sometimes at heavy infection levels) in several areas near the burn. Both factors tend to increase tree stress and, regardless of insect conditions in the burn, trees throughout the general area are at some risk from bark beetles.

CONCLUSIONS

Red turpentine beetle and pine engraver activity may well continue in 1986 and 1987 until fire-damaged trees either die or begin to recover. Based on current observations, this activity does not appear to constitute a significant increase in the chances of trees in nearby unburned areas being killed by bark beetles.